

REMARKS

Claims 4-30, 33-40, and 53 have been previously withdrawn and cancelled from the present application. The claims remaining in the application are 1-3, 31, 32, and 41-51.

Double Patenting

Claims 1 and 2 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 83 of copending Application No. 10/543,307. This rejection is respectfully traversed.

A Terminal Disclaimer for Application No. 10/543,307 is submitted herewith.

Rejection Under 35 U.S.C. § 112

The Office Action has rejected claim 52 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is respectfully traversed. Claim 52 has been cancelled.

Rejection Under 35 U.S.C. § 103

The Office Action has rejected claims 1, 3, 31, 32, 43, 46-48, and 51 under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (U.S. 4,966,804) in view of Askeland et al. (U.S. 6,443,568). This rejection is respectfully traversed.

Hasegawa et al. is concerned with water impervious surfaces that are coated with water absorptive layers and then imaged with ink jet inks. The "coating layer.... is made from a composition comprising a highly water-absorptive resinous polymer with optional admixture of an inorganic porous powder". See column 2 line 30. These resins are described in column 3 line 31 to 39. They are not the same as in the present application, see page 11 of the specification. Hasegawa et al are solving a different problem by a different method. See column 1 line 67. "Since the coloring material or dye contained in the aqueous ink and deposited on and absorbed by the above mentioned coating layer of the water absorptive particulate material is soluble in water, drawbacks of

spreading and blur may sometimes be caused in the printed images on such a recording sheet to decrease or lose the legibility of the recorded images when the printed material is brought into contact with water or prolongedly kept under adverse conditions of high temperature....."

Under SUMMARY OF THE INVENTION Hasegawa states "The present invention accordingly has an object to provide a highly water-resistant printed material freed from the above described problems and disadvantages.....as well as to provide a method for preparation of such water resistant printed material."

The present application does not relate to spreading and blur of the printed image as it is not confined to the coloring material that is soluble in water. Examples in the present application use a C82 Epson printer that works with pigment based ink jet inks which are insoluble in water. Page 10 line 14 of the present application states "Aqueous ink jet inks may be based on dye colorants or pigments and may contain technologies to enhance drying and wet strength."

In addition, Hasegawa is primarily concerned with improving water resistance and does not mention chemical resistance at all. Water resistance is tested for in his Examples and there is one mention of mechanical strength at the end of Example 6. Hasegawa is silent on chemical resistance as described in the present application, page 13 lines 1 to 6.

In section 7, the Examiner says that Hasegawa discloses overcoating the surface with a water-based coating in columns 3-4 lines 56-17, however, no reference to aqueous coatings could be found. The Examiner may be concluding that when the patent states that the polyisocyanate is preferably in the form of an organic solution it is only a preference and implies that water can be used. But it may be implying that as these polyisocyanates are generally liquids they can be coated without solvent. Polyisocyanates generally are unstable in water and therefore would not be used unless specially blocked which is not indicated here. The use of organic solvent is diametrically opposed to the present application, which, on page 11, line 22, and subsequent paragraphs, specifically teaches away from using organic solvents.

Whereas the present application is confined to undercoats which do not contain reactive species, there is no indication of this requirement by

Hasegawa, see column 3, lines 31-45 which includes crosslinked copolymers of isobutylene and maleic anhydride.

In summary, Hasegawa is distinct from the present application because it:

- i. Only seeks to solve spreading and blur of image caused by using water-soluble colorants and to give water resistance to the finished printed material.
- ii. Only seeks to use polyisocyanates as a means of doing this.
- iii. Does not have water based coatings.
- iv. Does not claim chemical resistance.
- v. Does not seek to avoid the use of volatile organic compounds.
- vi. Does not seek to avoid reactive species in the undercoat.

Askeland et al. relates to speeding up ink jet ink drying while avoiding ink spreading. This is done by applying a reactive fixer liquid either before or after ink jetting to precipitate out the colorant, see the Abstract. The process for use with paper and no mention of plastic is made. See column 1 lines 5 -15, 32 -35, 58-60, column 3 lines 38-44, column 4 line 7, and column 4 line 24.

The fixer is confined to the zone where the ink jet ink is printed and contains a reactive material. This is called "Underprinting" in the patent and is defined at column 1 line 38. "Underprinting is defined as applying a transparent liquid on paper just before applying inks."

The Examiner identifies the undercoating of Hasegawa with the fixer liquid of Askeland. However, the fixer liquid is clear and has to penetrate the media, see column 3 lines 27-28. Furthermore, the heating of the fixer before ink jetting to avoid bumps is confined to the print zone, column 3 line 58 Askeland.

Thus the combination of Askeland together with Hasegawa would not yield the limitations of the invention for the following reasons:

- i. The Askeland fixer contains reactive ingredients, and the layer of the present invention does not.
- ii. The Askeland material is only located in ink zones, and the layer of the present invention is not.

- iii. The Askeland fixer is for paper surfaces, and the layer of the present invention is for films.

The Examiner states that the motivation to combine the patents would be to get rid of bumps on the ink surface. However, this was only a problem in Askeland where ink/fixer precipitates occur, column 3 line 52, and not a problem of Hasegawa which does not have ink/fixer precipitation. Thus, Askeland does not fill in the gaps between Hasegawa and the present invention as discussed above.

The Office Action has rejected claim 2 under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (U.S. 4,966,804) in view of Askeland et al. (U.S. 6,443,568) in further view of Patterson et al. (U.S. 4,732,786). This rejection is respectfully traversed.

Patterson et al introduces insolublized polymers into a hydrophilic polymer composition see column 1 lines 29-34. In this patent it is stated that "stronger surfaces can be made which will be able to withstand the problems associated with printing processes, such as offset printing..." Contrast this with the present application, page 8 line 20, which states, "In the present application such coatings, while having characteristics of a solid film, may have poor adhesion to the substrate and poor water resistance and may be easily damaged if the surface contacts another surface or is handled in any way, until after imaging and lacquering when excellent physical and chemical adhesion can be achieved."

In the Summary of Invention of the present invention, the first sentence reads, "The present invention describes single coatings onto non-absorbent substrates on which aqueous ink jet inks are jetted with subsequent application of heat, without the use of reactive species in the ink and in the media used as a substrate coating." In Patterson, column 2 line 66, "According to the instant invention, a hydrophilic polymer is incorporated into the coating formulations. The polymer is insolubilized in situ through the use of a polyvalent metal cation, or by other means, such as covalent cross-linking or electron beam curing. The patent has many references to cross-linking. Therefore using the undercoat of Patterson as suggested by the Examiner, see page 7 section 8 of the rejection, would not produce the same results as the present invention because

Patterson's hydrophilic –hydrophobic binders, column 4 line 65, are given as examples of binders that are cross-linked to insolubilize them in the coating.

The Office Action has rejected claims 41 and 42 under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (U.S. 4,966,804) in view of Askeland et al. (U.S. 6,443,568) in further view of Uerz et al. (U.S. 7,219,989). This rejection is respectfully traversed.

Uerz et al. according to the Examiner, teaches water-soluble amino plastics column 9-11. This teaching cannot be found by applicant. Therefore, combining Uerz with Hasegawa and Askeland would be inappropriate..

The Office Action has rejected claim 44 and 49 under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (U.S. 4,966,804) in view of Askeland et al. (U.S. 6,443,568) in further view of Yang (U.S. 5,594,044). This rejection is respectfully traversed.

Yang teaches that for printing on non-porous plastics water-based inks are unsuitable. See Column 2 line 47. "To obtain the necessary qualities....solvent based inks must be used....." The solvent based inks of Yang would not be useful in Hasegawa and Askeland, which both address problems using aqueous based inks.

The Office Action has rejected claim 50 under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (U.S. 4,966,804) in view of Askeland et al. (U.S. 6,443,568) in further view of Irihara et al. (U.S. 6,428,143). This rejection is respectfully traversed.

Irihara et al. describes a process involving two ink jet inks, a slow drying black ink and a fast drying white ink. The medium is paper and the white ink is ink jetted to produce an undercoat for the black ink just where it is imaged. Since the independent claim from which this claim depends has already been distinguished from the prior art, it is believed that this claims is also patentable.

CONCLUSION

Dependent claims not specifically addressed add additional limitations to the independent claims, which have been distinguished from the prior art and are therefore also patentable.

In conclusion, none of the prior art cited by the Office Action discloses the limitations of the claims of the present invention, either individually or in combination. Therefore, it is believed that the claims are allowable.

If the Examiner is of the opinion that additional modifications to the claims are necessary to place the application in condition for allowance, he is invited to contact Applicant's attorney at the number listed below for a telephone interview and Examiner's amendment.

Respectfully submitted,



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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.